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## PATENT APPLICATION

### IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

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Yoichiro TABATA, et al.

Appln. No.: 10/588,735

Group Art Unit: 1752

Confirmation No.: 9675

Examiner: Not Yet Assigned

Filed: August 8, 2006

For: PHOTOCATALYST MATERIAL PRODUCING METHOD AND PHOTOCATALYST  
MATERIAL PRODUCING APPARATUS

#### SUBMISSION OF ENGLISH TRANSLATION OF INTERNATIONAL SEARCH REPORT (ISR)

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Submitted herewith please find an English Translation of the International Search Report (ISR) issued in the international stage of this case. The Examiner is respectfully requested to acknowledge receipt of this English Translation of the ISR.

Respectfully submitted,

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WASHINGTON OFFICE

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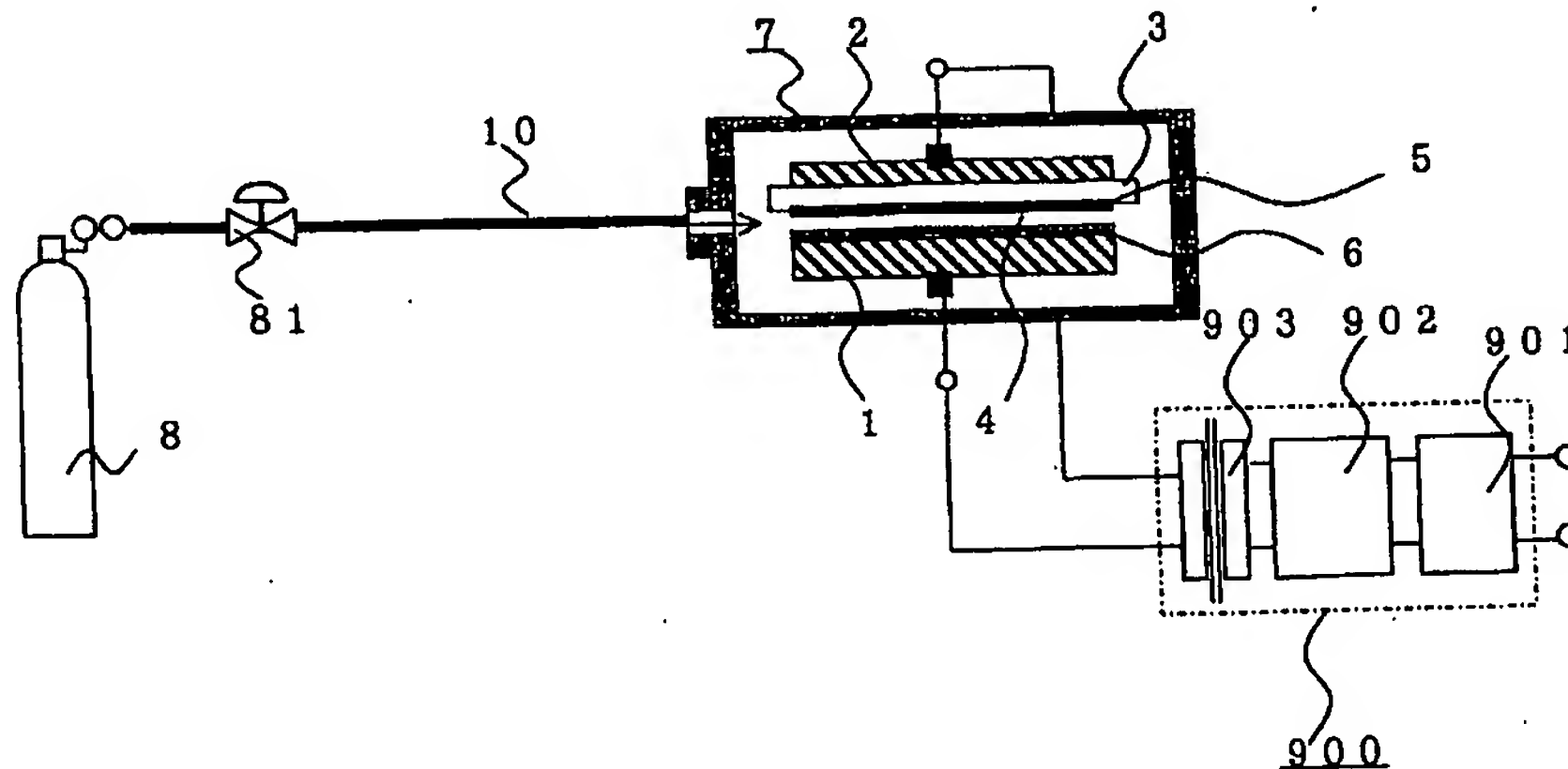
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B01J 37/34 (2006.01) C01B 13/11 (2006.01)
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[続葉有]

(54) Title: METHOD FOR PRODUCING PHOTOCATALYTIC MATERIAL AND APPARATUS FOR PRODUCING PHOTOCATALYTIC MATERIAL

(54) 発明の名称: 光触媒物質生成方法および光触媒物質生成装置



(57) Abstract: This invention provides a novel apparatus for producing a photocatalytic material, which, unlike the conventional dry film forming method in which a photocatalytic material is produced by PVD and CVD, can produce a large amount of a high-quality photocatalytic material by a chemical reaction in a light- high-field plasma in a highly concentrated ozone medium state having a very high oxidizing capability, and a method for producing a photocatalytic material. In the method for producing a photocatalytic material and an apparatus for producing a photocatalytic material, a pair of opposed electrodes are provided through a dielectric material in a discharge space into which gas composed mainly of oxygen gas has been fed. An alternating voltage is applied across the electrodes to cause dielectric barrier discharge (silent discharge or creeping discharge) in the discharge space, whereby ozone gas-containing oxygen gas is produced and, further, a metal or a metal compound is modified to a photocatalytic material by the above dielectric barrier discharge.

(57) 要約: この発明は、従来の乾式成膜法の PVD と CVD による光触媒物質を生成する方式ではなく、酸化能が非常に高い高濃度オゾン媒質状態で、光-高電界プラズマ中での化学反応で、高品質の光触媒物質を多量の生成することができる、新たな光触媒物質生成装置及び光触媒物質生成方法を提供する。この発明によ

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KG, KZ, MD, RU, TJ, TM), ヨーロッパ (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

添付公開書類:

— 国際調査報告書

2文字コード及び他の略語については、定期発行される各PCTガゼットの巻頭に掲載されている「コードと略語のガイダンスノート」を参照。

る光触媒物質生成方法および光触媒物質生成装置は、酸素ガスを主体にしたガスを供給した放電空隙に、誘電体を介し、対向させた1対の電極を設け、電極間に交流電圧を印加させ、放電空隙に誘電体バリア放電(無声放電または沿面放電)を発生させることにより、オゾンガスを含んだ酸素ガスを作り出し、かつ上記誘電体バリア放電によって、金属もしくは金属化合物を光触媒物質に改質させるようにした。

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2005/013170

## A. CLASSIFICATION OF SUBJECT MATTER

B01J35/02(2006.01), B01J37/34(2006.01), B01J19/08(2006.01), C01B13/11  
(2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B01J35/02(2006.01), B01J37/34(2006.01), B01J19/08(2006.01), C01B13/11  
(2006.01)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2005
Kokai Jitsuyo Shinan Koho	1971-2005	Toroku Jitsuyo Shinan Koho	1994-2005

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
Caplus (STN)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	JP 2004-359537 A (Toshiba Mitsubishi-Electric Industrial Systems Corp.), 24 December, 2004 (24.12.04), Claims 7 to 13; Par. Nos. [0021], [0022], [0080]; Fig. 18 & US 2004/0223893 A1	1-3, 7-12, 14 4-6, 13, 15
A	JP 2004-249157 A (Konica Minolta Holdings Kabushiki Kaisha), 09 September, 2004 (09.09.04), (Family: none)	1-15
A	JP 2004-137101 A (Yasukawa Electric Corp.), 13 May, 2004 (13.05.04), (Family: none)	1-15

☒ Further documents are listed in the continuation of Box C.☐ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance  
"E" earlier application or patent but published on or after the international filing date  
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)  
"O" document referring to an oral disclosure, use, exhibition or other means  
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention  
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone  
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art  
"&" document member of the same patent family

Date of the actual completion of the international search  
18 October, 2005 (18.10.05)

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01 November, 2005 (01.11.05)

Name and mailing address of the ISA/  
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2005/013170

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2001-073116 A (Mitsubishi Heavy Industries, Ltd. et al.), 21 March, 2001 (21.03.01), (Family: none)	1-15